

# AN EVALUATION OF ADA LIBRARY DIAGRAMS

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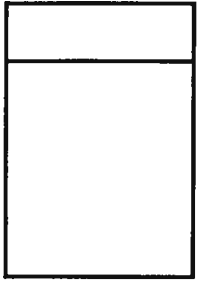
# DEFINITIONS

- **COMPILATION UNIT:** A specification, body, or both of a subprogram, package, generic subprogram, generic package, or subunit presented for compilation as an independent text. If it depends on other compilation units (i.e., it imports some of their resources), it is preceded by a context specification that identifies these other compilation units.
  
- **LIBRARY UNIT:** A compilation unit in some program library that is NOT a subunit of any other unit (i.e., is not a body of a subprogram, package, or task declared in another compilation unit using a separate clause).
  
- **ADA LIBRARY DIAGRAM:** A diagram that documents (for the designer, coder, tester, technical manager, customer, QA, and/or maintenance programmer) the static structure of an Ada library in terms of its component library units (e.g., identifier, type of unit, specification and body, exported resources) and their dependency relationships.

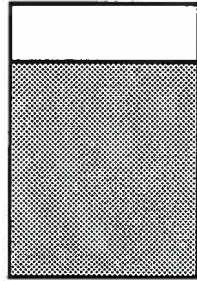
# PURPOSE AND IMPORTANCE

- **PURPOSE OF ADA LIBRARY DIAGRAMS:** to conveniently provide in an understandable format sufficient information regarding the relevant static Ada structure in terms of its library units and their dependencies.
- Library Units are the basic building blocks of Ada designs. Because almost all subprograms and generic subprograms are encapsulated inside packages and generic packages, the vast majority of all library units are packages and generic packages.
- Library Diagrams document the package architecture, the primary Ada design architecture. The tasking architecture optimally requires a separate graphic because tasks are not library units and are therefore always encapsulated in packages, subprograms, or generics.
- Subunits and nested programming units (e.g., tasks) are logically at a lower level of abstraction than the library units and are thus not clearly distinct, separate units to the designer and would not usually be shown on Ada Library Diagrams.

# BOOCH ICONS



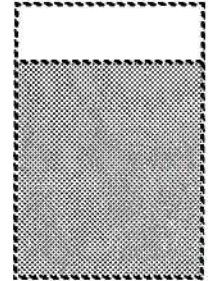
SUBPROGRAM  
SPECIFICATION



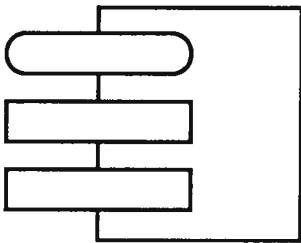
SUBPROGRAM  
BODY



GENERIC  
SUBPROGRAM  
SPECIFICATION



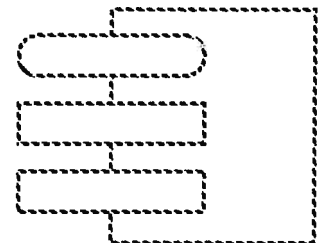
GENERIC  
SUBPROGRAM  
BODY



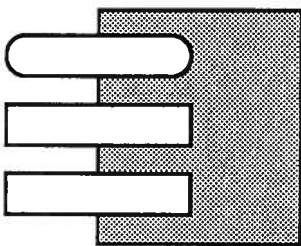
PACKAGE  
SPECIFICATION



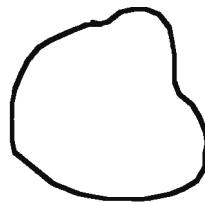
DEPENDENCY  
ARROW



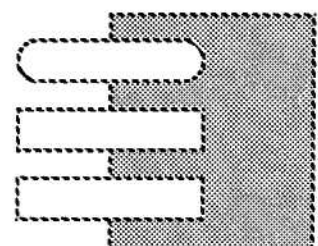
GENERIC PACKAGE  
SPECIFICATION



PACKAGE  
BODY

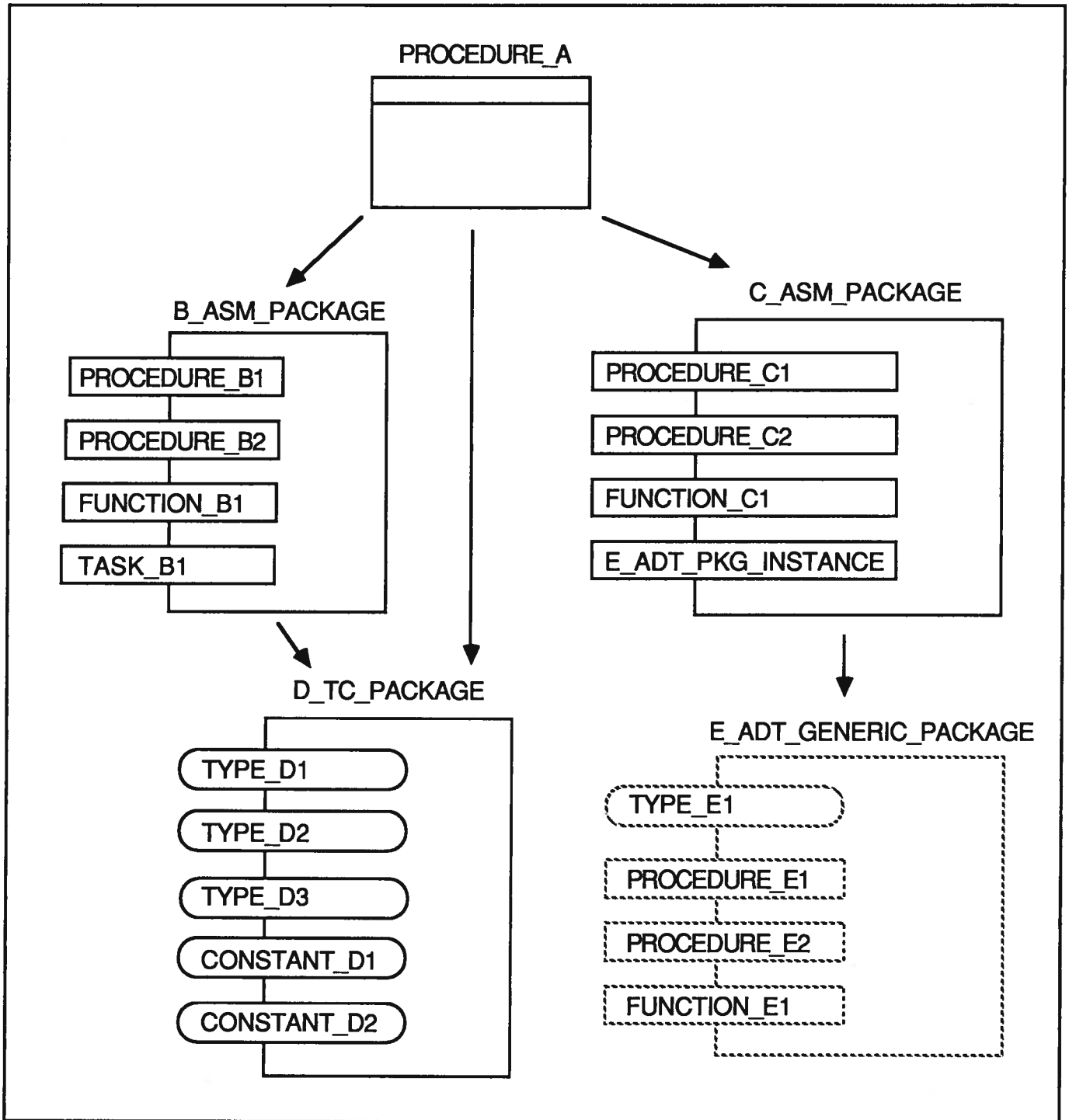


UNDEFINED  
ENTITY

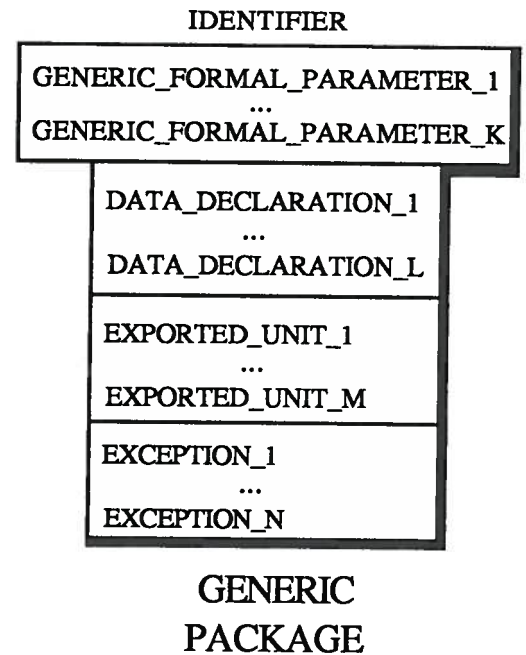
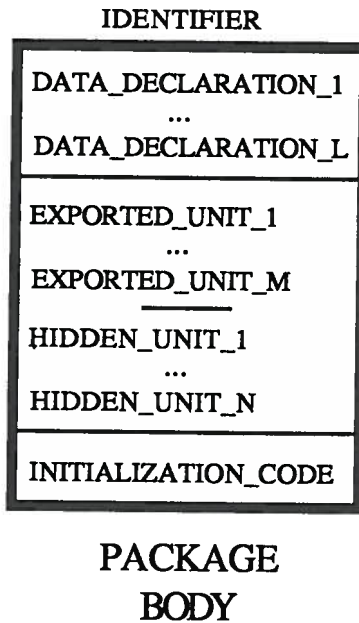
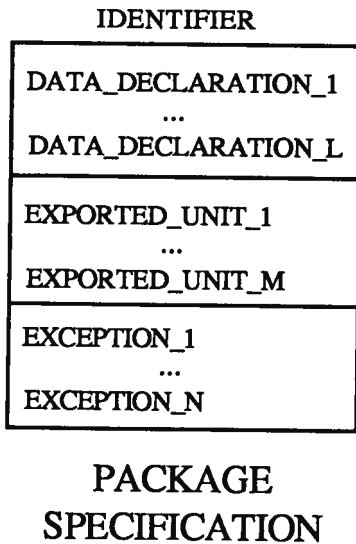
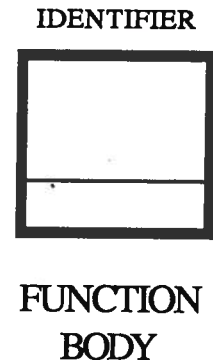
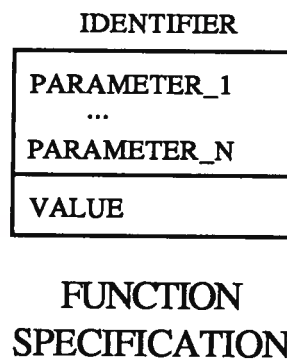
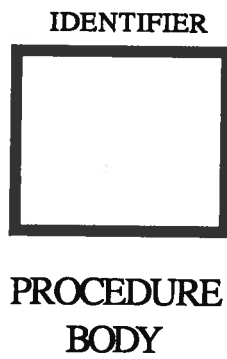
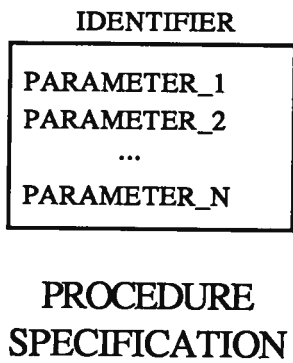
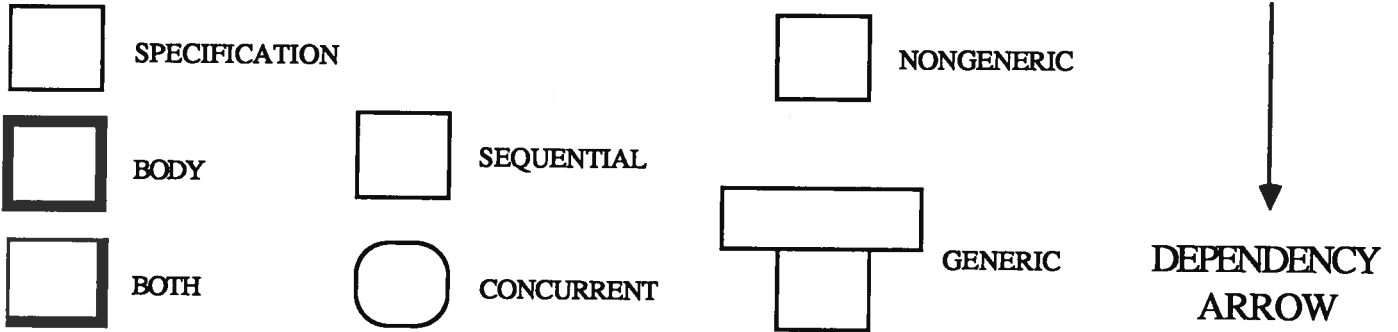


GENERIC PACKAGE  
BODY

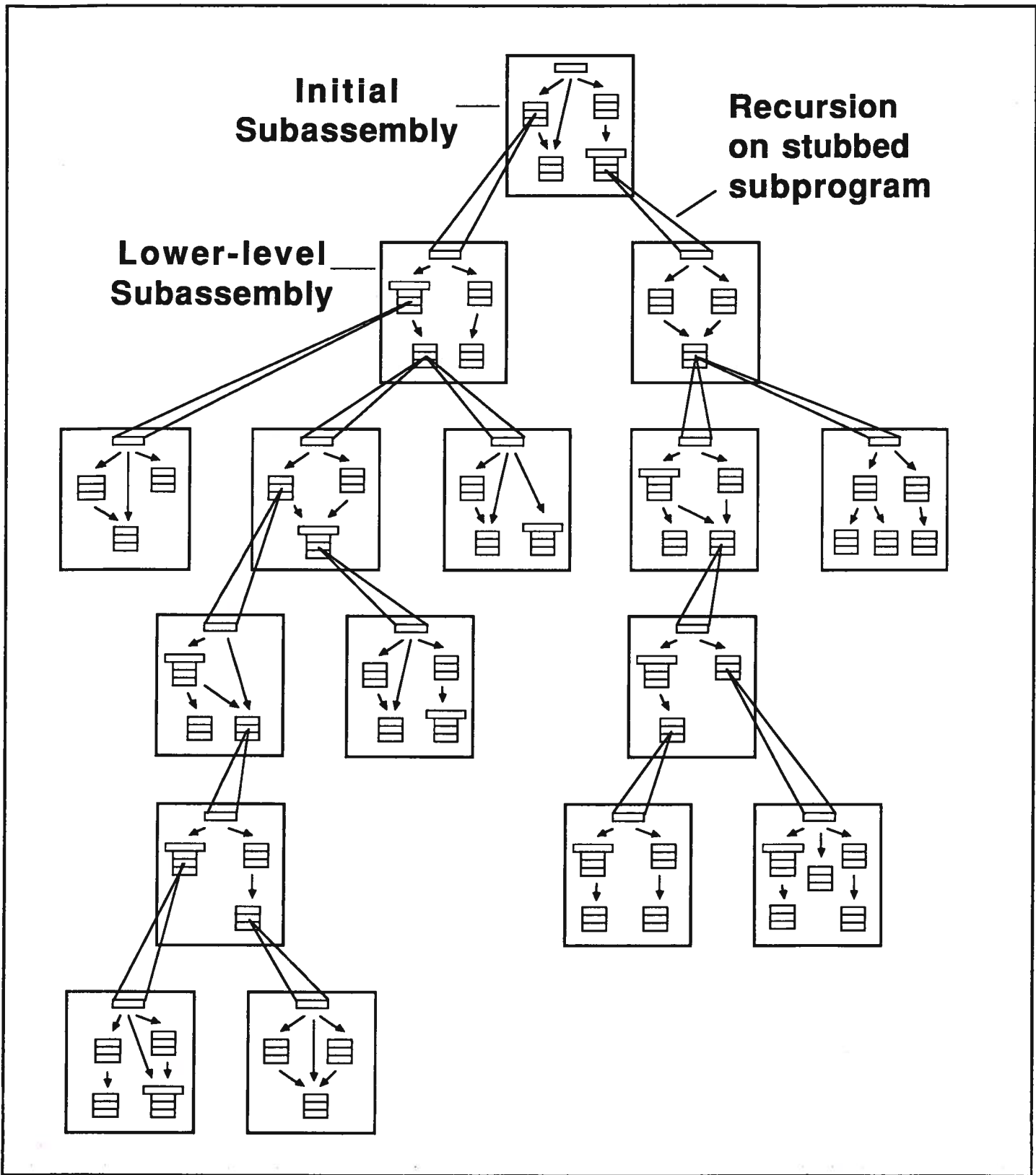
# BOOCH DIAGRAMS



# FIRESMITH ICONS

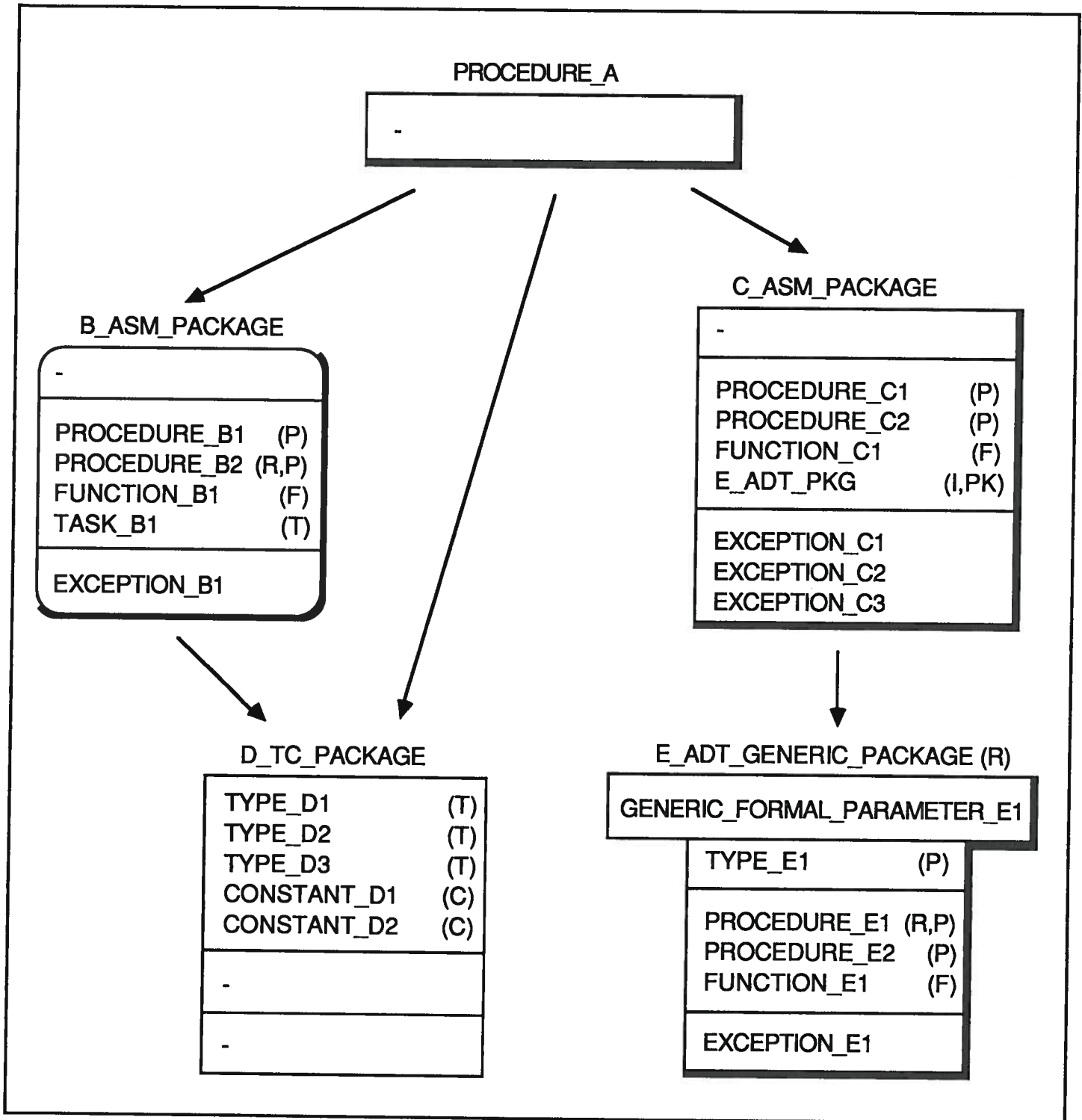


# ASSEMBLY OOD DIAGRAMS

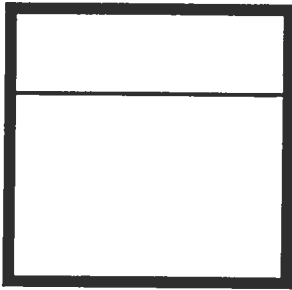




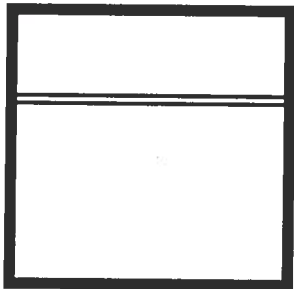
# SUBASSEMBLY OOD DIAGRAMS



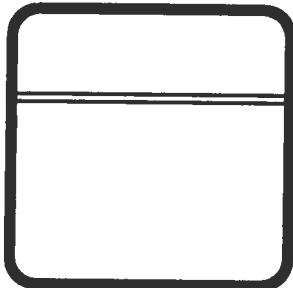
# CHERRY ICONS



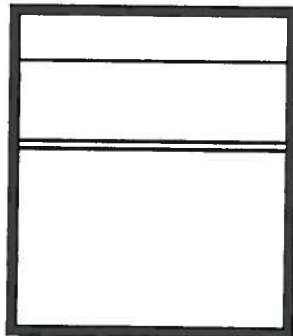
SUBPROGRAM LIBRARY UNIT



PACKAGE LIBRARY UNIT  
(SEQUENTIAL)

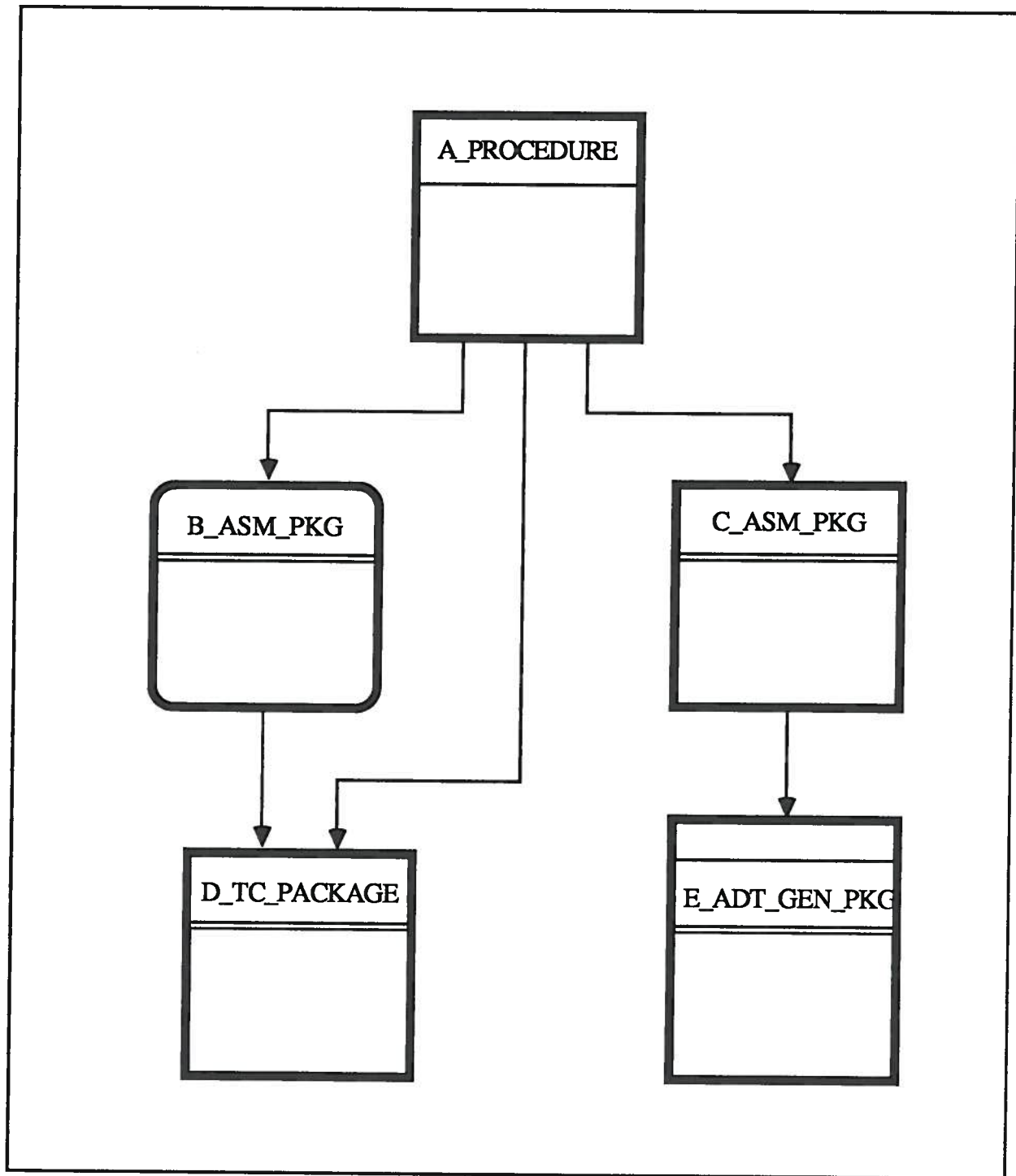


PACKAGE LIBRARY UNIT  
(CONCURRENT)

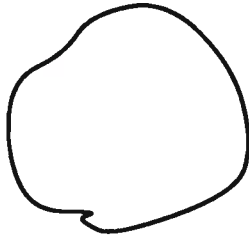


GENERIC PACKAGE LIBRARY UNIT  
(SEQUENTIAL)

# LIBRARY (OBJECTS) GRAPHS



# BUHR ICONS



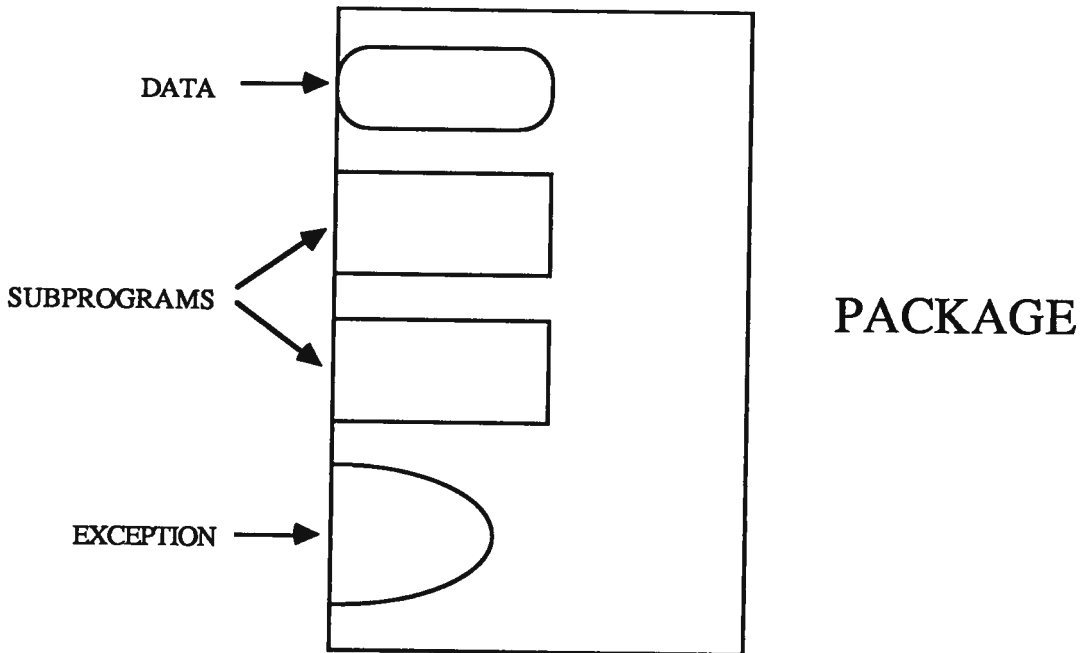
UNCOMMITTED MODULE



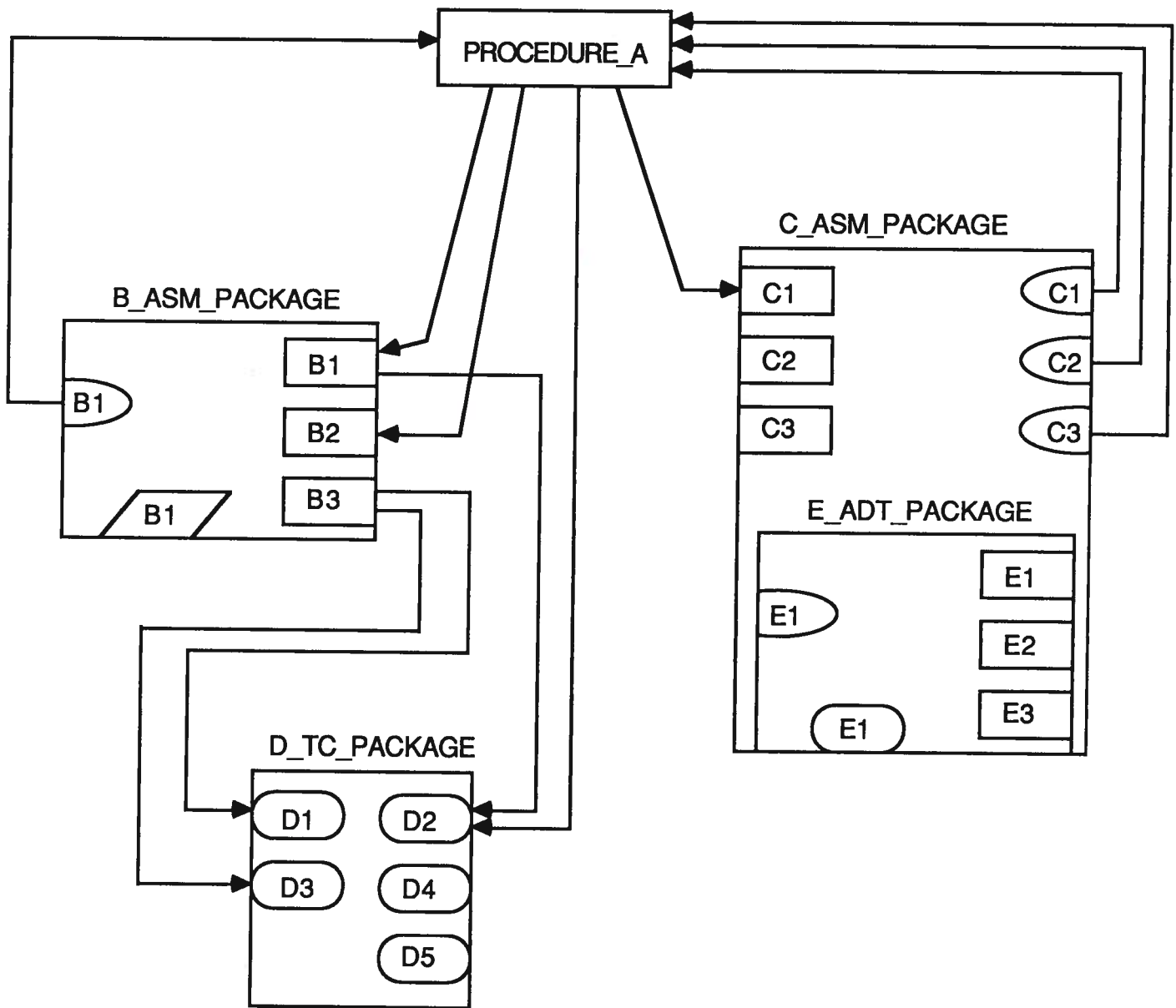
SUBPROGRAM LIBRARY UNIT



SUBPROGRAM CALL,  
ENTRY CALL, OR DATA ACCESS



# STRUCTURE GRAPHS



# INFORMATION CONTENT

EVALUATION CRITERIA	ICONS			
	BOOCH	FIRESMITH	CHERRY	BUHR
IDENTIFIERS	NEW: HINT OLD: MOST	ALL	FEW	FEW (PARTIAL)
INFORMATION HIDING	YES	YES	NO	NO
SPECIFICATION VS. BODY	YES	YES	NO	NO
SEQUENTIAL VS. CONCURRENT	NO	YES	YES	INDIRECTLY
VISIBILITY (DEPENDENCY)	YES	YES	YES	NO !
NESTING	YES	NO	NO	YES
SUBPROGRAM LIBRARY UNITS	YES	YES	YES	YES
- PROCEDURES	NO	YES	NO	NO
- FUNCTIONS	NO	YES	NO	NO
PACKAGE LIBRARY UNITS	YES	YES	YES	YES
- DATA DECLARATIONS	NEW: HINT OLD: YES	YES	NO *	YES
- ENCAPSULATED UNITS	NEW: HINT OLD: MOST	YES	NO *	YES
- EXCEPTIONS	NO	YES	NO *	YES
GENERIC LIBRARY UNITS	YES	YES	YES	NO !
- GENERIC INSTANCES	NO	NO	YES	NO

\* INFORMATION AVAILABLE ON SEPARATE DIAGRAM.

# OTHER CONSIDERATIONS

EVALUATION CRITERIA	ICONS AND LIBRARY DIAGRAMS			
	BOOCH	FIRESMITH	CHERRY	BUHR
INTUITIVENESS	POOR	GOOD	POOR	GOOD
SUPPORTS MULTIPLE LEVELS	NO	YES	NO	NO
SPACE UTILIZATION	POOR	GOOD	GOOD	POOR
NEEDS ONLY SIMPLE TERMINAL	NO	YES	NO	NO
SUPPORTS AUTOMATIC PDL	NEW: LITTLE OLD: SOME	MOST	LITTLE	SOME

## CONCLUSION

BY PORTRAYING THE STATIC STRUCTURE AND PACKAGING ARCHITECTURE OF ADA DESIGNS, ADA LIBRARY DIAGRAMS ARE VERY IMPORTANT TOOLS FOR DESIGNING, UNDERSTANDING, AND MAINTAINING ADA SYSTEMS.

FIRESMITH ICONS, ASSEMBLY OOD DIAGRAMS, AND SUBASSEMBLY OOD DIAGRAMS PROVIDE THE BEST CURRENT GRAPHICS FOR ADA LIBRARY DIAGRAMS.